INSTRUCTION MANUAL
MODEL 4207D
DIGITAL COMPRESSIVE STRENGTH TESTER

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S/N: _____

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General Information

Introduction

The Model 4207D Digital Compressive Strength Tester is a hydraulic press system that may be used to apply known compressive loads to a sample at known rates. The maximum load is 50,000 Lbf. The Model 4207D Tester meets all the requirements for cement compressive testing as specified in API Specification 10.

Purpose and Use

The Model 4207D Compressive Strength Tester is designed to test the compressive strength of sample cement cubes in compliance with API Specification 10. The Model 4207D enables the operator to achieve steady, uniform loading of the sample in order to obtain an accurate measure of the compressive strength.

Description

The sample load schedule is programmable as a series of ramps and dwells using a controller. The system is equipped with a digital display that retains the maximum load that causes the failure of the sample under test.

Features and Benefits

- Programmable loading rates from 500 to 10,000 psi/min (2000 to 40,000 Lbf/min)
- Maximum load of 50,000 Lbf
- Polycarbonate safety shield with door safety interlock
- Multiple load rates/durations can be programmed as a single control operation
- Precise rate control electronic system and hydraulic pressure release valves providing outstanding control of the loading rate
- Interface to Model 5270 Data Acquisition and Control Software (used to acquire and plot the results)

Specifications

Power Requirements:	200-240 VAC, 50 Hz or 60 Hz
Maximum Load:	50,000 pounds-force (Lbf), 222 kN
Maximum Loading Rate:	40,000 Lbf/Minute (178 kN/min)
Maximum Load Dwell:	3 min @ 50,000 Lbf (222 kN) with initial oil temperature below 75°F (24°C)
Maximum Oil Temperature:	175°F (60°C)
Environmental:	40-120°F (4-49°C) 95% Relative Humidity (non-condensing)

Serial Interface:	Modbus-RTU Protocol	
Hydraulic Fluid:	SAE 10W30 Synthetic Oil	
Shipping Dimensions:	Load Frame 48” (122 cm) high x 24” (61 cm) wide x 28” (71 cm) deep Control Cabinet 54” (138 cm) high x 28” (71 cm) wide x 30” (76 cm) deep	
Net Weight:	Load Frame Control Cabinet	360 lbs (164 kg) 570 lbs (260 kg)

Safety Requirements

Note: Before attempting to operate the instrument, the operator should read and understand this manual.

The Chandler Engineering Model 4207D Digital Compressive Strength Tester is designed for operator safety. Any instrument that is capable of high pressures should always be operated with **CAUTION**!!

To ensure safety:

- Locate the instrument in a low traffic area.
- Post signs where the instrument is being operated to warn non-operating personnel.
- Read and understand instructions before attempting instrument operation.
- Observe caution notes!
- Observe and follow the warning labels on the instrument.
- Never exceed the instrument maximum temperature ratings.
- Always disconnect main power to the instrument before attempting any repair.
- Appropriately rated fire extinguishers should be located within close proximity.
- Only trained personnel should operate the system.
- The system should never be operated while unattended.
- All personnel using the system should wear safety glasses.
- The system must be located in a safe environment.
- All safety interlocks must be operational and properly adjusted.
- The system must be properly maintained, and any defective components serviced or replaced.

Safety Features

- ***Door interlock switch***: Prevents the operation of the system when the press door is open.
- ***Over temperature safety circuit***: Prevents the operation of the system if the oil temperature exceeds the specified limit.
- ***Automatic system shut-down***: The controller automatically terminates the active program when the sample fails.

Where to Find Help

In the event of problems, your local sales representative will be able to help or you can contact the personnel at Chandler Engineering using the following:

- Telephone: 918-250-7200
- FAX: 918-459-0165
- E-mail: chandler.sales@ametek.com
- Website: www.chandlereng.com

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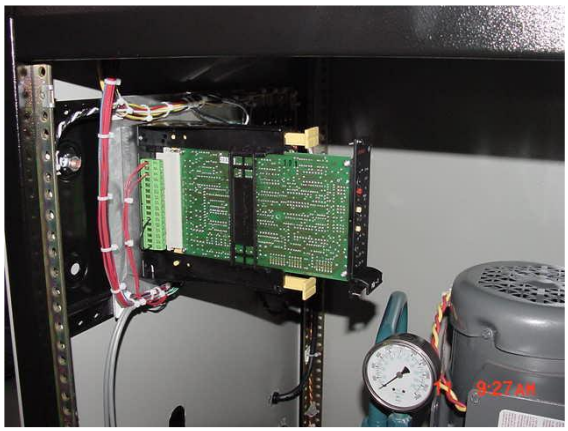
Section 1 – Installation

Unpacking the System

Carefully unpack the Model 4207D and all of its accessories. Visually inspect for any damage that may have occurred during shipping. After the instrument is removed from the shipping crate, the equipment and spare parts should be checked against the packing list to insure that all parts have been received and none are damaged.

Remove the front cover of the instrument to remove the circuit board and spare parts that are individually wrapped to prevent damage during shipment. Slide the circuit board into the backplane as illustrated below; then replace the front cover.



Note: File an insurance claim with your freight carrier if damage has occurred during shipping. Verify all parts shown on the enclosed packing list have been received. If items are missing, please notify Chandler Engineering immediately.

Utilities Required

Electrical: 200-240 VAC, 50 Hz or 60 Hz, depending on model.

Tools/Equipment Required

No special tools are required for the installation of the Model 4207D. Standard hand tools are sufficient.

Connecting Power

Connect the power cord to an approved grounded receptacle in accordance with local wiring codes. Model 4207D-60Hz is intended for use on, 200-240 VAC 60 Hz and Model 4207D-50Hz is intended for use on, 200-240 VAC 50 Hz.

The system power switch on the front panel also serves as a circuit breaker. If the breaker trips, correct the electrical problem then reset the breaker by cycling the switch.

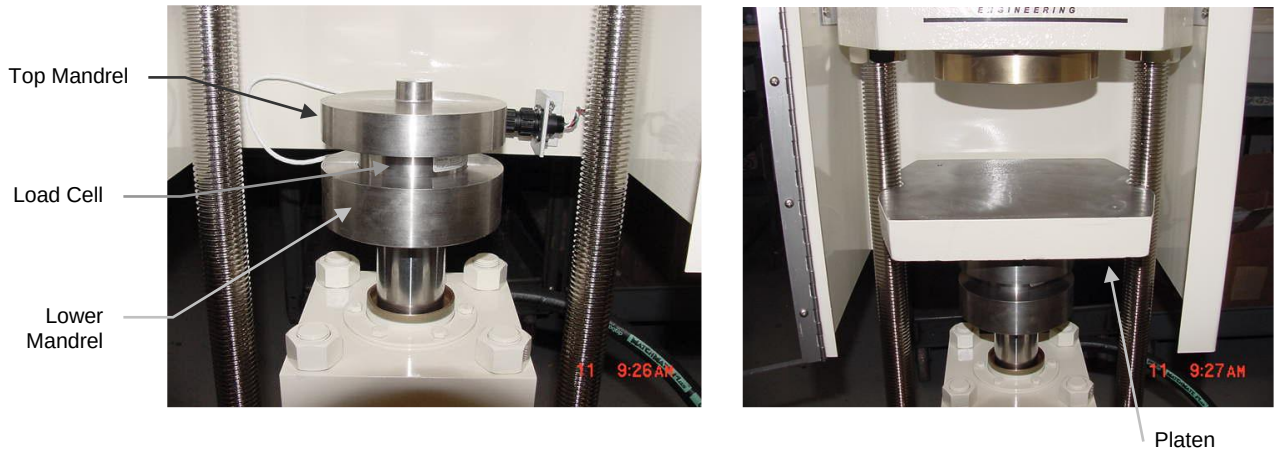
Connecting the Press to the Power Unit

There are three connections between the load frame and the control cabinet, 2 hydraulic lines and a 25-pin cable connection.

1. Connect the two hydraulic lines to the quick-connect fittings on the left side of the control cabinet. Make certain that the hydraulic connections are fully coupled. The hose from the bottom of the cylinder is connected to the bottom connection on the control cabinet.

2. Connect the cable between the two 25-pin connectors located on the load frame and the control cabinet.

3. Assemble the bottom platen and load cell in accordance with the illustration below:



Connecting to a Data Acquisition System

Serial Data Connection

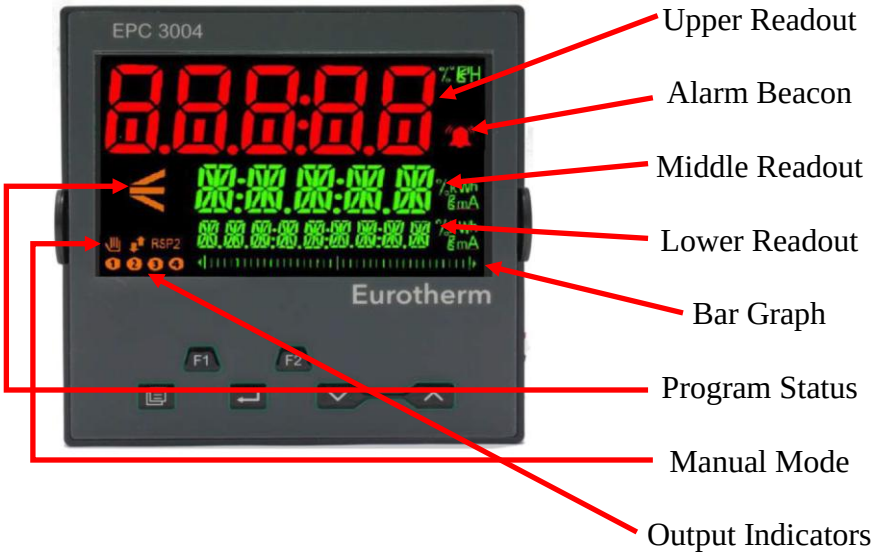
The control cabinet includes a 9-pin connector on the left of the enclosure that is used for communications with the optional Chandler Engineering Model 5270 Data Acquisition and Control Software. A cable is supplied with the unit.

Section 2 - Operating Instructions

Before operating the 4207D it is necessary to be familiar with the pressure controller.

Programming the Controller

The Model 9050 controller used with the 4207D system features user defined segment programming (8 segments maximum). Using these segments, sample load ramp and dwell segments are defined.



Upper Readout: Displays the current value of the sample load in pounds-force (Lbf). This value is green when the controller or display is not in an Alarm state.

Alarm Beacon: Flashes when any new alarm occurs (Over Range, Under Range or Sample Crushed). To acknowledge (clear) an alarm, press the Page and Scroll buttons. The Alarm Beacon will stay illuminated when an alarm is acknowledged but the alarm condition still exists.

Middle Readout: Displays the target Set Point. When in Manual Mode, the units are in % output. When in Automatic Mode, the units are in pounds-force.

Lower Readout: Displays the maximum sample load. The maximum can be reset by the 5270 software or through the front panel of the controller.

Bar Graph: A graphical representation of the current output power. The scale is 0 to 100% (left-to-right).

Program Status: Indicates the current Program Step:

Indicates Ramp / Step Up

Indicates Dwell (Flashing indicates Dwell End)

Indicates Ramp / Step Down.

Manual Mode: Indicates Manual Mode has been selected. In Manual Mode, the Raise and Lower buttons operate on the Output Power. In Automatic Mode (this icon is off), the Raise and Lower buttons operate on the Set Point.

Output Indicators: Illuminate when the appropriate output is activated. Output 1 is the Output Power sent to the Hydraulic Power Unit. The other outputs are unused.

F1: Toggles between Automatic and Manual mode. When in Manual Mode the "hand" icon is illuminated.

F2: Program Run / Reset. Press once to Start the program. Press again to Reset the program.

Page: Used to page through the various menus in the controller.

Scroll: Used to scroll through the parameter settings within a menu page.

Note: Press Page + Scroll to return to the "Home" Display. When at the Home Display, Page + Scroll will acknowledge any alarm.

Lower / Raise: Used to change the value of a parameter. Press and hold the button for rapid changes.

Configuring the controller to perform a sample load program involves defining a series of ramp and dwell segments.

Once the program exists, the program is executed by pressing the ***F1*** button to select Automatic Mode (the "hand" icon will turn off) and then the ***F2*** button to start the program (the Program Status indicator will turn on).

To terminate the program, the ***F2*** button is pressed to reset the program (the Program Status indicator will turn off). Press the ***F1*** button to place the controller in manual mode (the "hand" icon will turn on).

Use the following procedure to define and run a program:

1. Turn the system ***On***.

2. Press the “Page” button until P.SET is displayed
3. Press “Scroll”; Observe P.NUM (Program Number) 1 is indicated
4. Press “Scroll”; Verify that HB.STY (Holdback Style) is set to PROG.
5. Press “Scroll”; Verify that HB.TYP (Holdback Type) is set to OFF.
6. Press “Scroll”; Verify that RAMP.U (Ramp Units) is set to P.SEC (Per Second).
7. Press “Scroll”; Verify that DWEL.U (Dwell Units) is set to SECS (seconds).
8. Press “Scroll”; Verify that P.CYC (Program Cycles) is set to 1.
9. Press “Scroll”; Change P.END (Program End Type) is set to rSEt (Reset). Available options are:
    a. dwEL (Dwell): Dwell at the last set point.
    b. rSEt (Reset): Reset to the set point used prior to starting the program.
    c. tRAk (Track): same effect as Dwell

10. Press “Scroll”; Observe that S.NUM (Segment Number) 1 appears.
11. Press “Scroll”; Obseve that S.NAME (Segment Name) is set to “S1”. Segment Names are used when the Segment Type is set to CALL.
12. Press “Scroll”; Change S.TYPE (Segment Type) as desired. For this example, tImE (Time to Target) is used. Available options are:
    a. rAtE (Ramp at Rate to Target): Ramp the set point at a given Rate (°/min) for a given Time.
    b. tImE (Time to Target): Ramp to a given Target for a given Time.
    c. dwEL (Dwell): Dwell at the last set point for a given Time.
    d. StEP (Step to Target): Instantaneously change to the given Set Point.
    e. CALL (Call Program Number): Execute another program as a subroutine (this is not common).
    f. ENd (End Program): The very last segment of a program. Behavior is defined by the Program End Type (see above).
13. Press “Scroll”; Change TSP (Target Setpoint) to the desired initial sample load (150 psi) using the “Lower” or “Raise” buttons. This is the pressure to be achieved at the end of the ramp.
14. Press “Scroll”; Change R.TIME (Ramp Time) to 00:30 (30 seconds), the desired ramp time in mm:ss.

15. Press “Scroll”; Observe that S.NUM (Segment Number) is now 2.
16. Press “Scroll”; Observe that S.NAME (Segment Name) is now S2.
17. Press “Scroll”; Change S.TYPE (Segment Type) to “dwEL” (Dwell).
18. Press “Scroll”; Change DUR (Duration) to 00:30 (30 seconds).

19. Press “Scroll”; Observe that S.NUM is now 3.
20. Press “Scroll”; Observe that S.NAME is now S3.
21. Press “Scroll”; Change S.TYPE to “tImE” (Time to Target).
22. Press “Scroll”; Change TSP (Target Set Point) to 48000.
23. Press “Scroll”; Change R.TIME (Time to Target) as desired:
    a. For the API Specification 10 “Fast” Rate, the Time to Target is 3:00 (3 minutes)
    b. For the API Specification 10 “Slow” Rate, the Time to Target is 12:00 (12 minutes)

24. Press “Scroll”; Observe that S.NUM is now 4.
25. Press “Scroll”; Observe that S.NAME is now S4.

26. Press “Scroll”; Set S.TYPE (Segment Type) to “dwEL” (Dwell).
27. Press “Scroll”; Set DUR (Duration) to 2:00 (2 minutes)

28. Press “Scroll”; Observe that S.NUM is now 5.
29. Press “Scroll”; Observe that S.NAME is now S5.
30. Press “Scroll”; Change the S.TYPE (Segment Type) to “ENd”

31. Press “Scroll”; P.NUM (Program Number) 1 is indicated.
32. Press the “Page” button twice to return to the Home display.

Operating Procedure

1. Turn the system ***On***.

2. If required, push the cylinder control switch, located to the right of the power switch, to the ***Down*** position to lower the platen. This will lower the platen to provide adequate clearance for the sample.

3. Turn the cylinder control switch to the ***Off*** position.

4. The platen has an engraved square that will approximately match the size of the sample block. Place the sample within the center of this square. It is critical that the sample be centered on the platen. Leave approximately ¼” of clearance between the sample and the top platen.

5. Close the door on the press assembly.

6. Reset the peak value stored in the display.

   a. From the Home display, press the Scroll button several times until “No” is on the Upper Readout and “RESET M” is on the Middle Readout.
   b. Press the Up or Down arrow to select YES. The display will flash and the YES will change back to No.
   c. Press the Page button to return to the main display.

   Note: The 5270 DACS software will automatically reset the peak value stored by the display when a data acquisition test is started.

7. Confirm the controller is idle and in Manual mode:
   a. If the Hand icon is OFF, press the F1 button and the Hand icon should turn on.
   b. If the Program Status indicator is ON, press the F2 button to reset the program and turn off the Program Status indicator.

8. Select the proper ramp time in segment three of the controller program (see above) to match the rate desired. Additionally, select the target pounds-force value in segment three (Seg.n 3), if the desired value is different than 48000 Lbf. DO NOT change any other segment values.

Note: For low compressive strength samples 8.0-12.0 min is the recommended duration. For high compressive strength samples 2.0-3.0 min is the recommended duration.

9. Place the press direction control switch in the UP position.

10. Increase the controller output to 1.0% by pressing the UP arrow button. The press will rise, contact the upper platen and stop. The press will then hold in an idle position for 20-30 seconds.

11. While the press is in idle, decrease the controller output to 0.0% by pressing the DOWN button.

12. Wait for the press to engage the hydraulics. An audible change in pump rate will be heard.

13. Place the controller in automatic mode by pressing the F1 button The hand indicator will illuminate.

14. Start the program by pressing the F2 button. The Program Status indicator will illuminate.

    a. The program will increase the applied force to 150 Lbf clamping force in 30 seconds.
    b. The program will hold the 150 Lbf clamp force for another 30 seconds.
    c. The program will begin applying the chosen rate of force.

15. The sample will crush at its peak compressive strength.

16. When the sample fails, the controller will automatically terminate the program and remain in the standby state. The message “Sample Crushed Alarm” will start scrolling.

    If a sample fails gradually, without a sudden fracture, the controller may not automatically terminate the program. In this case, the operator must manually stop the program by pressing the F2 button. In the event that the operator manually stops the program the peak value is not stored on the display.

    To stop the press manually:
    a. Place the press direction control switch in the OFF position. This will stop the press from rising.
    b. Reset the controller program by pressing the F2 button (the Program Status indicator will turn off).
    c. Press the F1 button to switch from automatic (AUTO) mode to manual (MAN) mode. The Hand indicator will illuminate.

17. Reset the rate alarm on the controller by pressing PAGE and SCROLL together.

18. Place the press direction control switch in the DOWN position to lower the platen for cleaning.

19. Place the press direction control switch in the OFF position.

20. Open the safety door, dispose of the sample.

21. Clean both the upper and lower platens.

Interpreting the Results

API Cement Compressive Strength Test

To calculate the compressive strength of a sample, the peak load at which failure occurred must be determined. The peak value is obtained from the display or from graphical data (if a data acquisition system is used). The peak value is divided by the sample cross-sectional area to obtain the compressive strength using the following equation:

$$Compressive\ Strength = \frac{Maximum\ Load}{Sample\ CrossSectional\ Area}$$

If a standard ASTM cement cube is used, the cross-sectional area is 4.0 in^2 (2 inch x 2 inch cube). To obtain the Compressive Strength in psi, divide the Maximum Load value by 4.0.

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Section 3 – Maintenance

Maintenance Schedule

MAINTENANCE SCHEDULE Model 4207D Digital Compressive Strength Tester					
COMPONENT	EACH TEST	MONTHLY	3 MONTHS	6 MONTHS	ANNUAL
Oil	Check Level				Every two years, change the oil
System Pressure					Check the system pressure, adjust to 2600 psi
Press Assembly (See procedure below)					Perform maintenance checks below
Hydraulic Power Unit (See procedure below)					Perform maintenance checks below
High Temperature Limiting Circuit					Verify operation
Platen Control Switch			Adjust as needed		
Load Cell			Calibrate		
This maintenance schedule applies to normal usage of two tests per day. Detailed procedures for these operations are contained in your manual.					

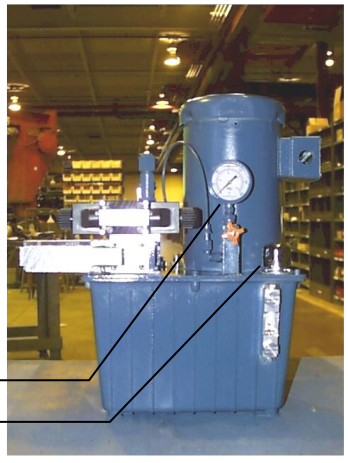
Filling the Oil Reservoir

The system reservoir will not require refilling unless the oil is drained or a leak occurs. The oil should be changed every two years. To fill the reservoir, use the following procedure:

1. Remove the reservoir fill cap.

2. Fill the reservoir using *10W30* synthetic oil. Verify that the oil is not contaminated. **Do not reuse old oil.**

3. Fill the reservoir until the oil level is mid-range on the sight gauge on the front of the reservoir.



Adjusting the System Pressure

The system pressure must be set to a value greater than the maximum pressure required by the system to create the anticipated loads. Use the following procedure to adjust the system pressure:

Note: The system pressure will decrease as the oil temperature increases. For this reason, adjust the system pressure when the oil temperature is at or near room temperature.

1. Verify that the system temperature is below 80°F (27°C).
2. Turn the system ***On***.
3. Place the cylinder control switch in the ***Up*** position.
4. Locate the relief valve adjustment and the system pressure gauge.
5. Adjust the relief valve until the system pressure gauge equals 2,600 ±200 psig.
6. Place the cylinder control switch in the ***Off*** position.
7. Tighten the relief valve lock nut.

Resetting the Maximum Temperature Limit

This system is equipped with a circuit that disables the hydraulic power unit if the oil temperature exceeds 70°C. The circuit must be manually reset for continued operation of the system.

To reset the temperature limit, press the red reset button located on the right panel.

Use the following procedure to adjust the maximum temperature limit:

1. Turn the system ***Off***.
2. Remove the back panel from the power unit.
3. Locate the temperature limit circuit board located on the left side of the enclosure (viewed from the rear).
4. Locate the calibrated dial on the circuit board. Adjust the knob to a value of 70°C.
5. To reset the temperature circuit, press the ***Red*** reset button located on the right panel.
6. To test the circuit, turn the system ***On*** then adjust the temperature set point below the oil temperature. Verify that the relay opens and an *LED* illuminates. Adjust the set point and press the ***Reset*** button.

Maintaining the Press Assembly

Use the following procedure to inspect the condition and safety of the press assembly:

1. Verify that the door limit switch is operational.

2. Inspect the cylinder and repair any leaks.

3. Inspect the hydraulic hoses and replace if signs of deterioration exist.

4. Inspect the upper and lower platens. The top platen must be level with respect to the base.

5. Inspect the columns on the press. Do not use the press if the columns are damaged in any way.

6. Inspect the load cell mandrels and replace if damaged or deformed.

Maintaining the Hydraulic Power Unit

Use the following procedure to inspect the condition and safety of the hydraulic power unit assembly:

1. Verify that the oil level is within the limits of the sight gauge on the reservoir.

2. Test the operation of the high temperature limiting circuit. Verify that the set point is 70°C.

3. Locate and repair any hydraulic leaks.

4. Verify that the fans located at the back of the enclosure are functioning.

5. Verify that the system hydraulic pressure is set at 2,600 psig. If pressure in less than 2,000 psig ± 200, see *Adjusting System Pressure* located in this section of the manual.

Adjusting the Platen Control Switch

The platen control switch is used to reduce the load on the sample as the sample is initially clamped. The platen assembly is equipped with a brass platen that is connected to a limit switch located above the steel top platen. As the sample is clamped, clearance between the brass and steel platens is used to close a switch that suspends the control program and hydraulics.

Once the sample is clamped without causing excessive initial loading, the program is restarted.

The limit switch may require periodic adjustment. Use the following procedure to adjust the limit switch:

*Warning: Make sure the instrument power is **off** before performing this procedure.*

1. Remove the cover plate from the limit switch assembly.

2. Bend the arm on the limit switch until the switch closes with an audible "click" as the brass platen is manually lifted. The switch must close before the brass platen touches the steel platen.

3. Manually operate the top limit switch and verify that the time delay relay inside the power unit trips with an audible "click." The delay is set to approximately 20 seconds by adjusting the knob at the top of the relay.

4. Replace the cover plate.

Calibration

The 4207D uses a Linearization Table to calibrate the load cell. This table can be edited from the Chandler 5270 software or at the Controller. Refer to procedure 89-0200 (PROC,4207D LINEARIZATION) for detailed instructions.

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Section 4 - Troubleshooting Guide

Symptom	*Reason*	*Action*
Press does not operate.	Load frame door is open.	Close the load frame door.
	Over-temperature circuit has disabled the system.	Reset the over-temperature circuit by pressing the red button on the side panel.
	Controller is not programmed correctly.	Verify the program in the controller.
	Controller is not running.	Press the ***F1*** button to enter Automatic Mode. Press the ***F2*** button to start the program.
	Cable to the press is disconnected.	Connect the cable.
	Cylinder control switch is in off position.	Set the cylinder control switch to the ***UP*** position.
	Door or top platen limit switch is defective or requires adjustment.	Adjust door limit switch to close when the door is closed. Adjust the top platen control switch to close before brass platen touches the steel platen.
	Time delay relay is defective or not configured correctly.	Verify the time delay relay is set to operate with approx. 20 sec delay.
	Servo valve and/or related electronics are defective.	Contact Chandler Engineering service department.
Press will not reach programmed load.	Incorrect controller program.	Verify the program in the controller.
	Oil temperature is too hot.	Allow the oil to cool and repeat the test.
	System pressure is set too low.	Allow the oil to cool and verify that the system pressure is set at 2,600 psig.
	Over-temperature circuit is improperly adjusted.	Set the over-temperature circuit to operate at 70°C.
Displayed load values are incorrect	Controller calibration is incorrect.	With zero load, adjust the Controller PV.Offset.
		Recalibrate the display and controller.
Control program does not end when a cube fails.	Controller “rate of change” set point is incorrect.	Set the Threshold for Crush RoC (Rate of Change) alarm to 5500 or higher.

Symptom	*Reason*	*Action*
Sample fails prematurely.	Initial sample load is excessive.	Check the adjustment of the top platen limit switch. Adjust the top platen control switch to close before the platen touches the top of the press. Verify the time delay relay is set to approx. 20 seconds.
	Sample was not placed in the center of the platen.	Relocate the sample and repeat the test.
Serial communication problems.	Incorrect cable.	Verify the serial communication connections.
	Controller or display is not configured for serial communication.	Verify address and connection parameters (Baud Rate and Parity) match between Controller and 5270

Section 5 - Replacement Parts

Part Number	Description
07-0176	Thermocouple Assembly
C11149	Filter Element
P-1130	Fuse, 1A
P-1662	Fuse, 2A
P-3431	Relay, Solid-State, DC Control

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Section 6 – Drawings and Schematics

Document Number	Description
89-0151	Wiring Diagram
89-0170	4207D Pump Connections
89-0175	Procedure, 5270 Configuration

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
B6	V	ECN T6029; CHANGED TRANSDUCER CONNECTION	6/17/14	TC
F6	AA	ECN T7494; CHANGED FUSE TO P-1130	10/4/17	JS
C5	AB	ECN T8547; REPL C08975 W/ C10792	06/12/17	JS
C5	AC	ECN T9560; EPC UPGRADE	02/22/23	JS

FUSE TABLE
F1 = P-1662
F2 = P-1130
F3 = P-1662
F4 = P-1130
F5 = P-1130

P-3387 CIRCUIT BREAKER
230 VAC POWER
14 YEL
14 RED
230VAC
120VAC
C08586 TRANSFORMER
18 WHT
18 YEL
18 RED
18 BLK
14 RED
14 YEL
22 BLK
22 RED

5X C10901 BLK, YEL
2X C10900 BLK, RED
8X C10904 JUMPER
3X C10905 PLT, END
5X C10906 FUSE BLK
2X P-1662 FUSE, 2A
3X P-1130 FUSE, 1A
C07994 DIN RAIL 4.375"

C08889 C08889 FAN FAN

P-2209 OVER TEMPERATURE THERMOCOUPLE IMMERSED IN HYDRAULIC OIL 07-0176
22 WHT
22 WHT

C11062
(NO) (COM) (NC)

22 ORG
22 RED
SSR P-3431
C08126 DOWN OFF UP
18 BLK
DIRECTIONAL VALVE

C08466 POWER SUPPLY
Common Common +5 VDC +5 VDC +24 VDC
22 BLK
22 RED
18 RED
18 YEL
22 GRN
P-2051 (OPTIONAL)

P/Q CARD

Z		B
2	z2 +24V	2
4	z4 0V Power ref	4
6	z6 +15V/100mA	6
8		8
10		10
12		12
14		14
16	z16 test point 0...10v	16
18		18
20		20
22	z22 Q set point 0...+/-10V	22
24		24
26		26
28		28
30	z28 ext. P-controller disconnection 6...40V	30
32	z32 Potentiometer +10V supply	32

b2 0V Signal ref
b8 ground
b10 controller disconnect 0...40V
b12 P set point 0...10V
b14 P set point 0V ref
b22 Q set point 0V ref
b24 4...20mA signal
b28 0V signal ref

22 BLK
22 WHT
22 GRN
22 BLU
22 RED

PQI-1 0811405157
DIL 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
ON OFF

C18808 9050-4207D

SERVO VALVE
0811404600 Valve
A +24V
B 0V
C 0V ref
D 0...+/-10V Signal
E 0V Signal ref
F LVDT Signal 0...+/-10V
SL Chassis Ground
PROPER SHIELDING REQUIRED

RS485 C10792 GND TD(A) TD(B)

USE HEAT SHRINK TUBING ON ALL SOLDERED CONNECTIONS
P-3062 4 EA
P-3084

DB25P P-2437
C08439
DB25S P-2438
LOAD CELL 89-0190
PLATEN NC C NO
DOOR NC C NO C07685
LIMIT SWITCHES
PRESS ASSEMBLY

22 GRN
22 WHT
22 BLK
22 RED
22 BLU
22 ORG
22 WHT/BLU
22 WHT/ORG

PUMP MOTOR
MOTOR MUST RUN CW WHEN VIEWED FROM TOP

PRESSURE TRANSDUCER
U+ N/C U- S+
BRN WHT BLU BLK
4 CONDUCTOR CABLE

C09504 – RELAY
C09505 – SOCKET
RELAY FUNCTION SETTING: C020S

TO 24VDC SUPPLY
22 BLK (−)
22 RED (+)

C09494 – HYDRAULIC SYSTEM – 60HZ MOTOR
C09924 – HYDRAULIC SYSTEM – 50HZ MOTOR

NOTE: HYDRAULIC PUMP MUST BE DRIVEN IN CW DIRECTION. CONNECT POWER TO THE MOTOR AS FOLLOWS:
L1 – WIRE 1
L2 – WIRES 4, 8
JOIN WIRES 2, 3, 5

NOTE: REFERENCE PROCEDURES 89-0152, 89-0153 FOR CALIBRATION AND SETUP.
ALL DC SIGNAL WIRING TO BE ROUTED SEPARATELY FROM AC POWER WIRING.

	4207D
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]
TOLERANCES:
1 PLACE ±0.030 [.76]
2 PLACE ±0.010 [.25]
3 PLACE ±0.005 [.127]
ANGLES ±1/2°
SURF. FINISH 32

APPROVALS		DATE
DRAWN:	WJW	6/24/21
CHECKED:	JS	6/30/21
ENGR.:	WJW	6/24/21

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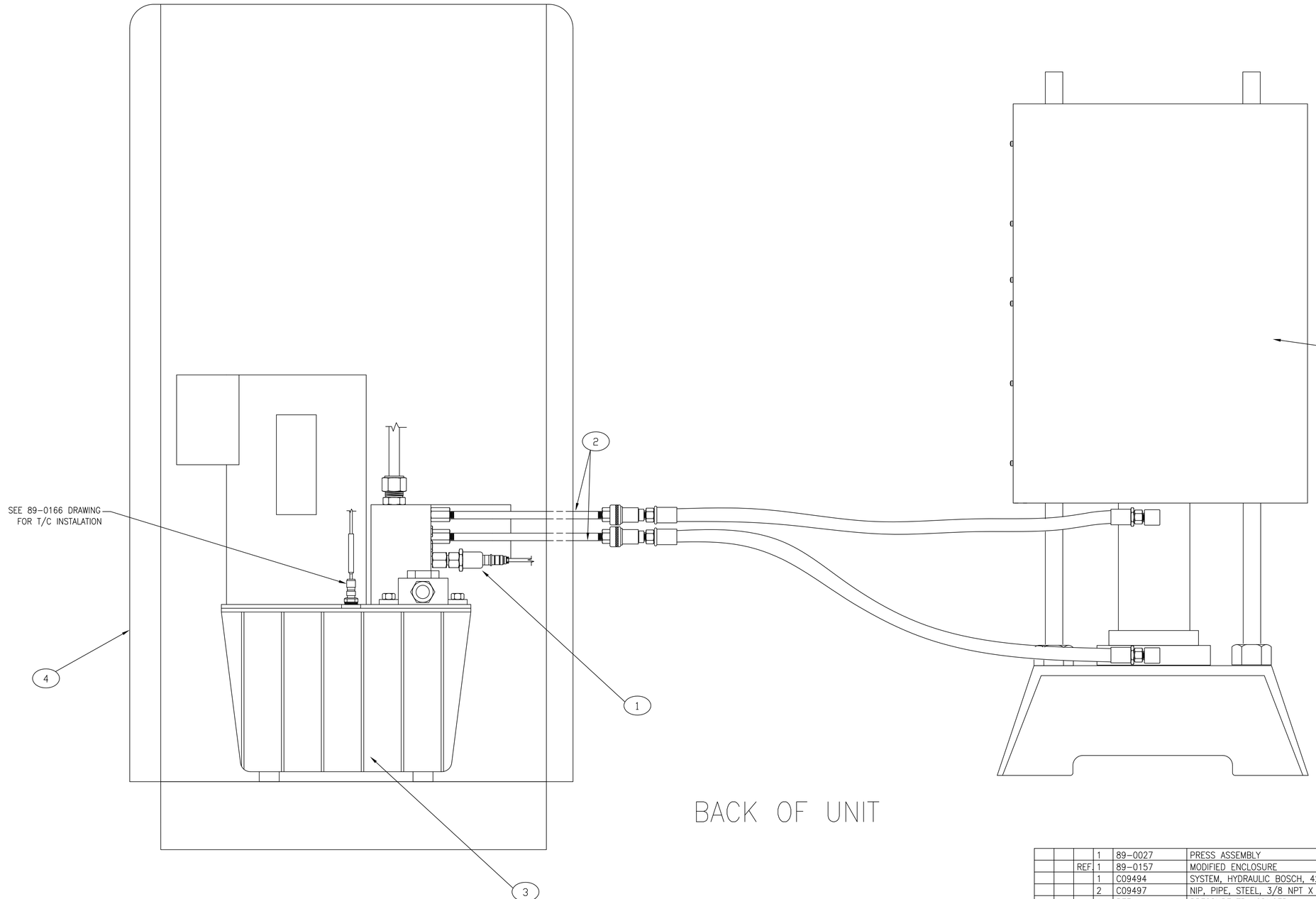
CHANDLER ENGINEERING

TITLE
WIRING DIAGRAM
MODEL 4207D

SIZE	S.O. NO.	DWG NO.	REV.
A2		89-0151	AC

SCALE: 1 = 1 | DO NOT SCALE DRAWING | SHEET: 1 OF 1

REVISIONS					
ZONE	REV	DESCRIPTION OF REVISION	DATE	APPROVALS	
	A	ISSUED, ECN 7241	01/22/01	JAC	BD
	B	ECN 7343, PLUMBING REVISIONS	04/10/01	JAC	JH



BACK OF UNIT

-04	-03	-02	-01	PART NUMBER	DESCRIPTION	MATERIAL SPEC.	ITEM
			1	89-0027	PRESS ASSEMBLY		5
		REF.	1	89-0157	MODIFIED ENCLOSURE		4
			1	C09494	SYSTEM, HYDRAULIC BOSCH, 4207D		3
			2	C09497	NIP, PIPE, STEEL, 3/8 NPT X 8 L		2
			1	REF.	PRESSURE TRANSDUCER		1

QTY. REQD. — PARTS LIST

NEXT ASSY: 4207D — USED ON

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES [mm]

TOLERANCES:
1 PLACE ±0.030
2 PLACE ±0.010
3 PLACE ±0.005
ANGLES ±1/2°
SURF. FINISH 63

APPLICATION

CHANDLER ENGINEERING

TITLE: 4207D PUMP CONNECTIONS

APPROVALS	DATE
DRAWN: JAC	01/22/01
CHECKED: BD	01/22/01
ENGR.: BD	01/22/01

SIZE A1 | S.O. NO. | DWG NO. 89-0170 | REV. B

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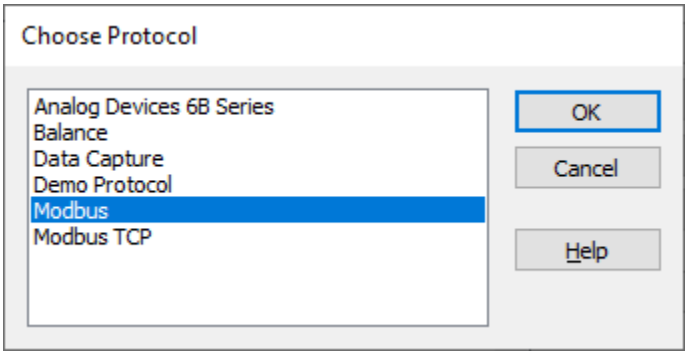
TITLE: Procedure, 5270 Configuration for 4207D
Instrument Model: Model 4207D Compressive Strength Tester

Revision	Date	Revised By	Description	Checked By
B	10/01/09	AMH	ECN T2532	TC
C	02/23/23	WJW	ECN T9560; EPC Update	JS

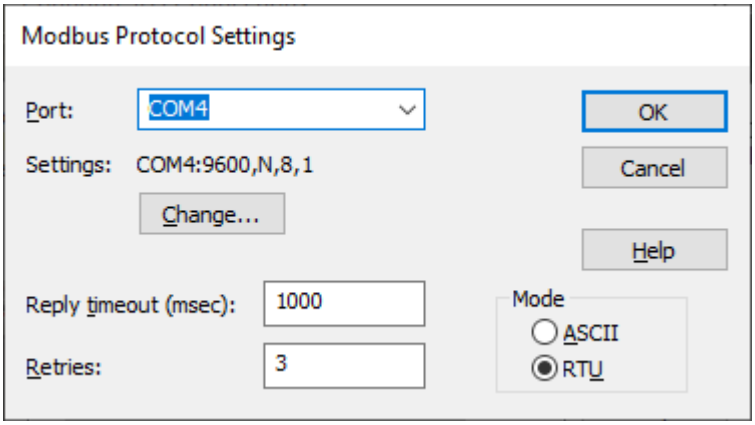
The Model 4207D Compressive Strength Tester may be used with the Model 5270 Data Acquisition and Control System (DACS). The following procedure is used to configure 5270 for use with this instrument. The following features are available:

- Acquisition of peak value from the controller
- Acquisition of the programmed value from the controller
- Download of API Fast and Slow load rates to the controller
- Automatic reset of the load display peak value when a new 5270 test is started

Using Tools > Configure > I/O Connections, configure an I/O connection using the Modbus protocol.



Select the COM port that is connected to the 4207D instrument. COM4 is illustrated; however, the actual port assignment may vary as required by the hardware configuration.



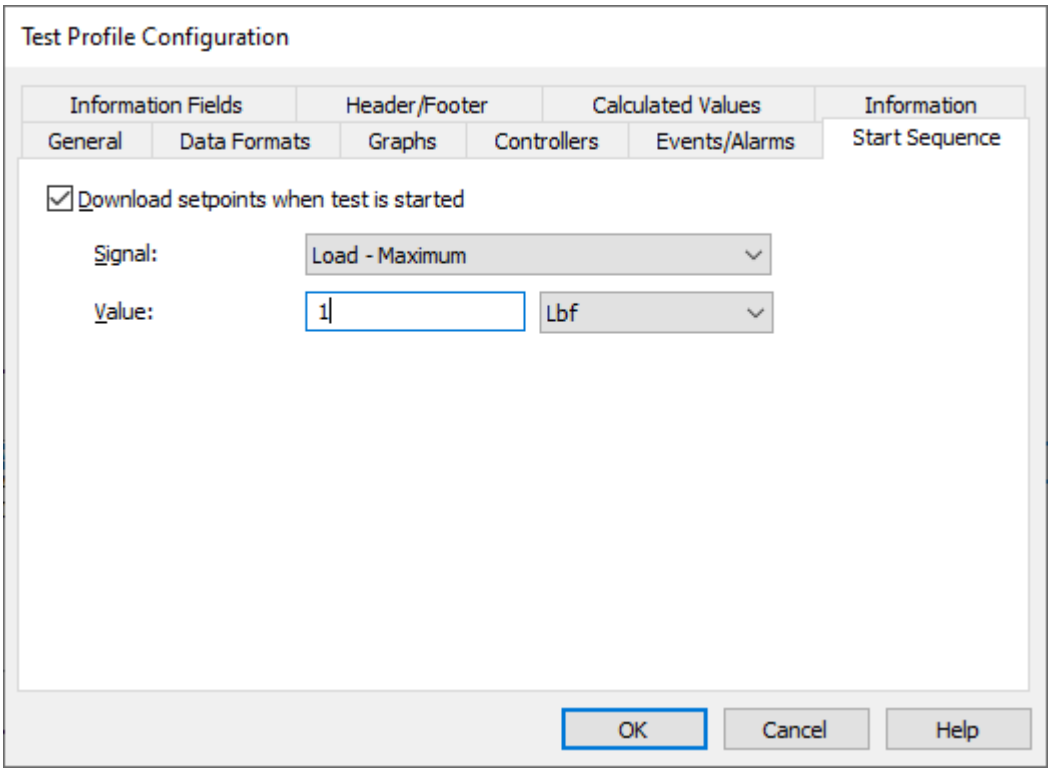
Using Tools > Configure > Instruments, select the Model 4207D Compressive Strength Tester from the list of available instruments.

Assign a name and file prefix. These choices may vary as desired.

Define the signal I/O addresses as described below

- Load – Prog (Input Signal)
  - Address: 1:3076f
  - Units (Raw and Calibrated): Lbf
- Load – Maximum (Input Signal)
  - Address: 1:1555f
  - Units (Raw and Calibrated): Lbf
  - Advanced > Setpoint 1: 1:1554u (this setpoint allows 5270 to reset the maximum at the start of the test)
- Load (Controller)
  - Address: 1
  - Setpoint units: Lbf

When Configuring a Test Profile, select the Start Sequence tab and configure as shown below.



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Please Send Us Your Comments on This Manual

Model Number _____ Serial Number _____

Printing Date of this manual (from the Title Page) _____

Please circle a response for each of the following statements. Use:

(1)= Strongly agree (2) =Agree (3) =Neutral, no opinion (4) =Disagree (5) =Strongly disagree

a) The manual is well organized.	**1**	**2**	**3**	**4**	**5**
b) I can find the information I want.	**1**	**2**	**3**	**4**	**5**
c) The information in the manual is accurate.	**1**	**2**	**3**	**4**	**5**
d) I can easily understand the instructions.	**1**	**2**	**3**	**4**	**5**
e) The manual contains enough examples.	**1**	**2**	**3**	**4**	**5**
f) The examples are appropriate and helpful.	**1**	**2**	**3**	**4**	**5**
g) The manual layout is attractive and useful.	**1**	**2**	**3**	**4**	**5**
h) The figures are clear and helpful.	**1**	**2**	**3**	**4**	**5**

i) The sections I refer to most often are _____

_____

Other comments _____

_____

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My instrument is Chandler Model _____

Serial Number _____

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